GPIO LED Testing Assignment 1

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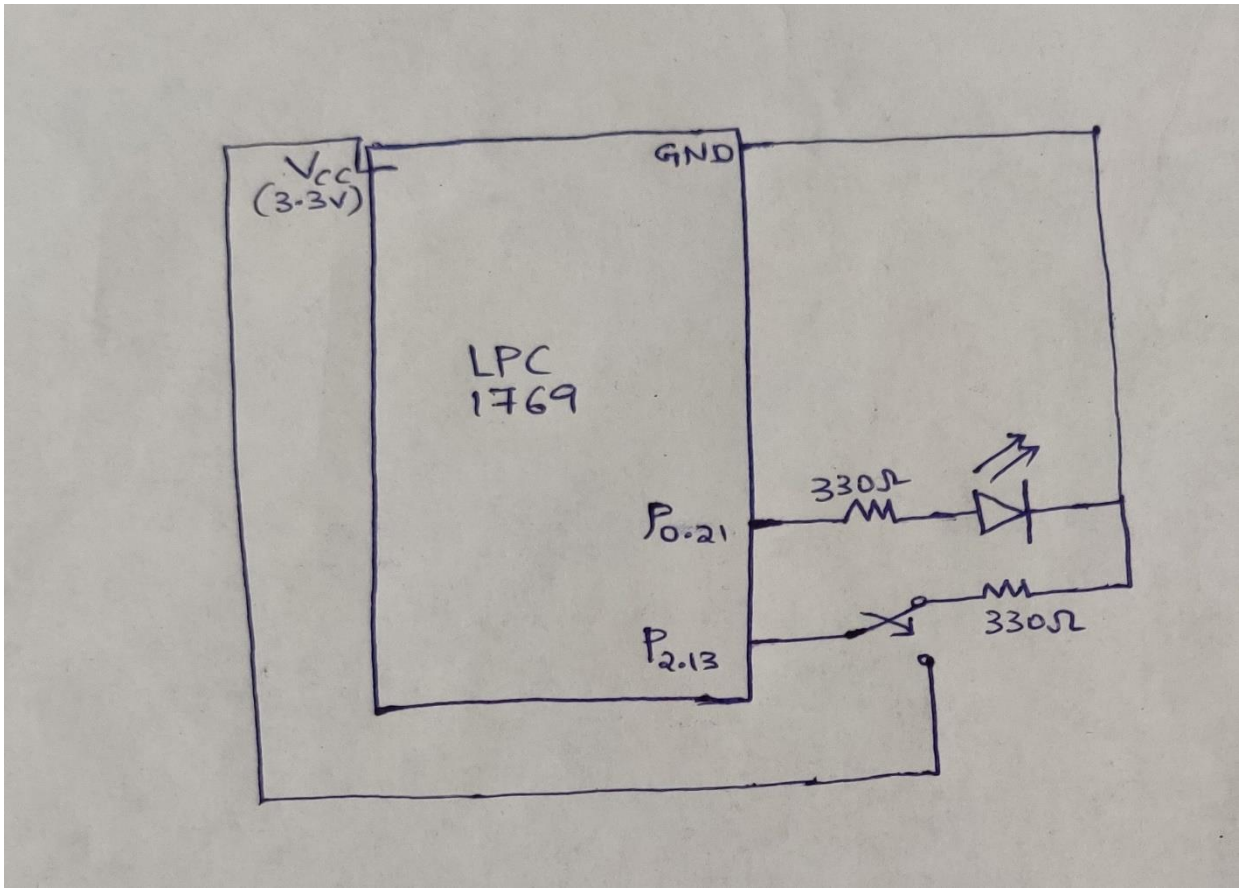
Target Board: LPC1769

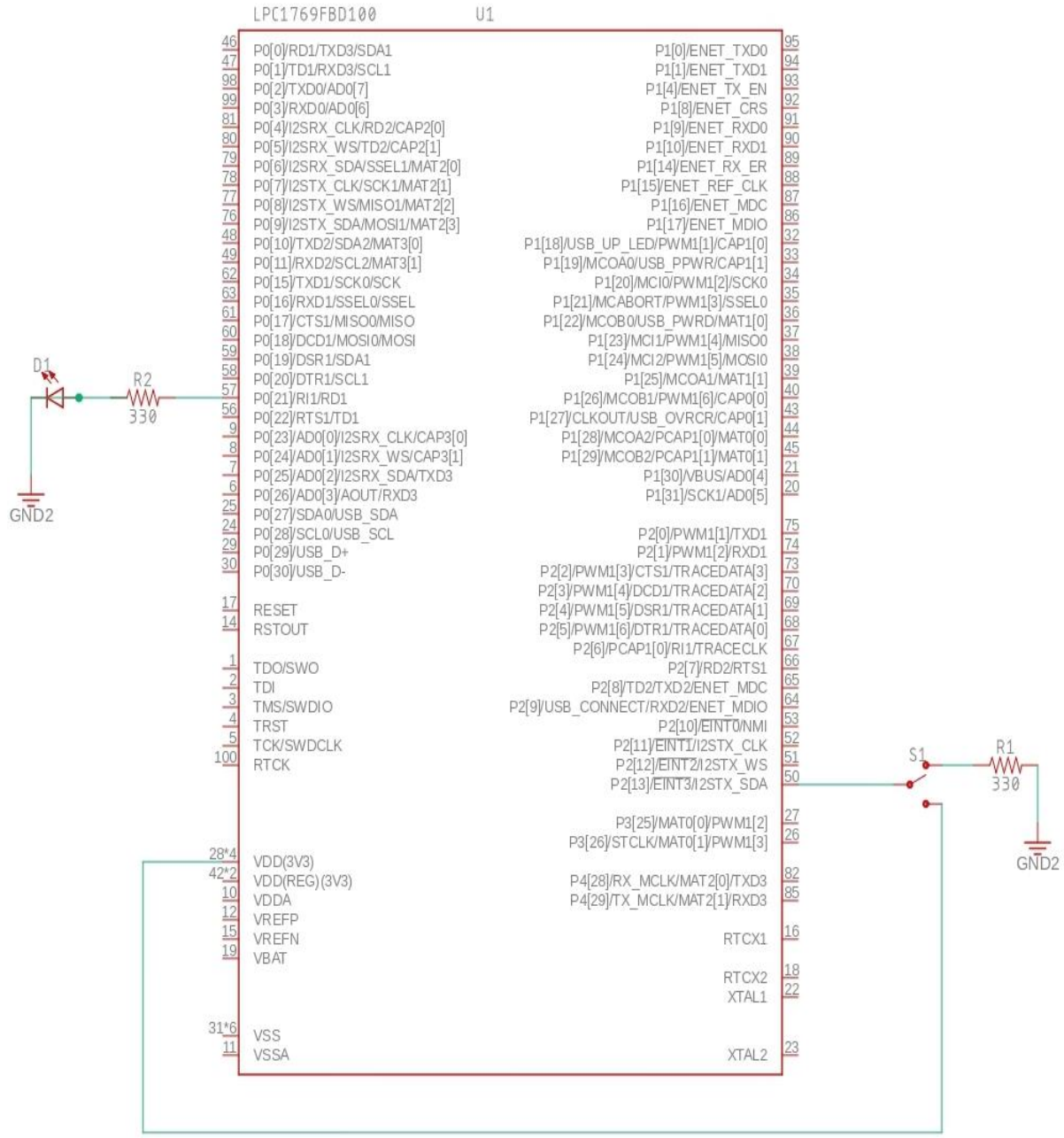
INTRODUCTION:

1. This activity is used to turn the LED ON and OFF using a push button and is controlled by a C program written in MCUXpresso.
2. If the push button is pressed, the LED turns ON and if it is released, the LED turns OFF.
3. The input pin used is p2.13 (j2-27) and the output pin used is p0.21 (j2-23).

SCHEMATIC:

The Schematic/Circuit on paper and in Eagle software is as follows:





CONNECTIVITY TABLE:

The connectivity table is as follows:

CPU Pin	J2	Note
GPP/P0.21	J2-23	Output
GPP/P2.13	J2-27	Input
GND	J2-1	GND

MATERIALS USED:

1. LPC1769
2. 330 Ohms Resistor
3. LED
4. Push Button (Switch)
5. Connecting wires

1. Submitted the project zip on canvas.
2. **SOURCE CODE:**

File Name: LED_ON_SWITCH_ASSIGNMENT.c

Code:

```
/*
===============================================================================
 Name        : LED_ON_SWITCH_ASSIGNMENT.c
 Author      : Harish Marepalli (016707314)
 Version     :
 Copyright   : $(copyright)
 Description : This program is used to turn the LED ON and OFF using a
                        push button. If the push button is pressed, the LED
                        turns ON and if it is released, the LED turns OFF. The
                        input pin used is p2.13 (j2-27) and the output pin used
                        is p0.21 (j2-23).
===============================================================================
*/
#ifdef __USE_CMSIS
#include "LPC17xx.h"
#endif

#include <cr_section_macros.h>

#include <stdio.h>

// TODO: insert other include files here

// TODO: insert other definitions and declarations here
```

```
//Initialize the port and pin as outputs.
void GPIOinitOut(uint8_t portNum, uint32_t pinNum)
{
	if (portNum == 0)
	{
		LPC_GPIO0->FIODIR |= (1 << pinNum);
	}
	else if (portNum == 1)
	{
		LPC_GPIO1->FIODIR |= (1 << pinNum);
	}
	else if (portNum == 2)
	{
		LPC_GPIO2->FIODIR |= (1 << pinNum);
	}
	else
	{
		puts("Not a valid port!\n");
	}
}

void GPIOinitInput(uint8_t portNum, uint32_t pinNum)
{
	if (portNum == 0)
	{
		LPC_GPIO0->FIODIR |= (0 << pinNum);
	}
	else if (portNum == 1)
	{
		LPC_GPIO1->FIODIR |= (0 << pinNum);
	}
	else if (portNum == 2)
	{
		LPC_GPIO2->FIODIR |= (0 << pinNum);
```

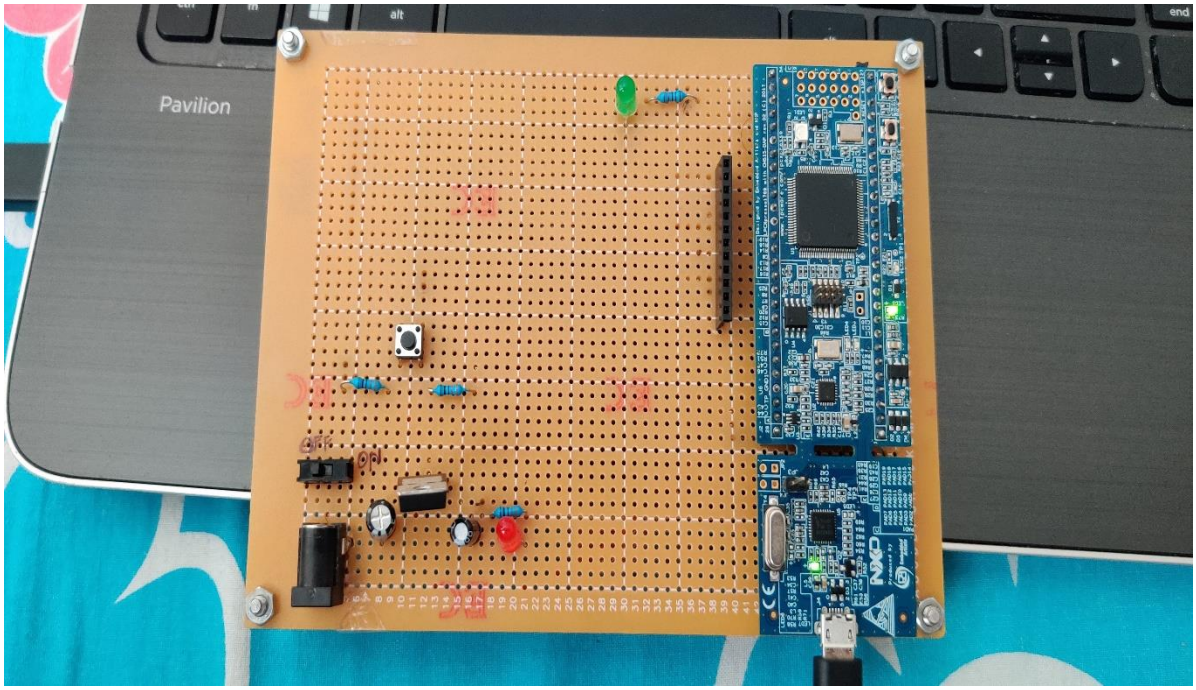
```
	}
	else
	{
		puts("Not a valid port!\n");
	}
}

void setGPIO(uint8_t portNum, uint32_t pinNum)
{
	if (portNum == 0)
	{
		LPC_GPIO0->FIOSET = (1 << pinNum);
		printf("Pin 0.%d has been set.\n",pinNum);
	}
	//Can be used to set pins on other ports for future modification
	else
	{
		puts("Only port 0 is used, try again!\n");
	}
}

//Deactivate the pin
void clearGPIO(uint8_t portNum, uint32_t pinNum)
{
	if (portNum == 0)
	{
		LPC_GPIO0->FIOCLR = (1 << pinNum);
		printf("Pin 0.%d has been cleared.\n", pinNum);
	}
	//Can be used to clear pins on other ports for future modification
	else
	{
		puts("Only port 0 is used, try again!\n");
	}
}
```

```
int main(void)
{

   // Force the counter to be placed into memory
   //volatile static int i = 0 ;
        uint32_t switchStatus;
        uint32_t switchPinNumber = 13;

        //LPC_PINCON->PINMODE4 = 0x08000000;
        //Set pin 0.21 as output
        GPIOinitOut(0,21);
        //Set pin 2.13 as input
        GPIOinitInput(2,13);

   while(1)
   {
        //Get the status of the switch
        switchStatus = (LPC_GPIO2->FIOPIN >> switchPinNumber) & 0x01;

                if (switchStatus == 1)
                {
                        //Activate pin 0.21
                        setGPIO(0,21);
                }
                else
                {
                        //Clear pin 0.21
                        clearGPIO(0, 21);
                }
   }
   return 0 ;
}
```

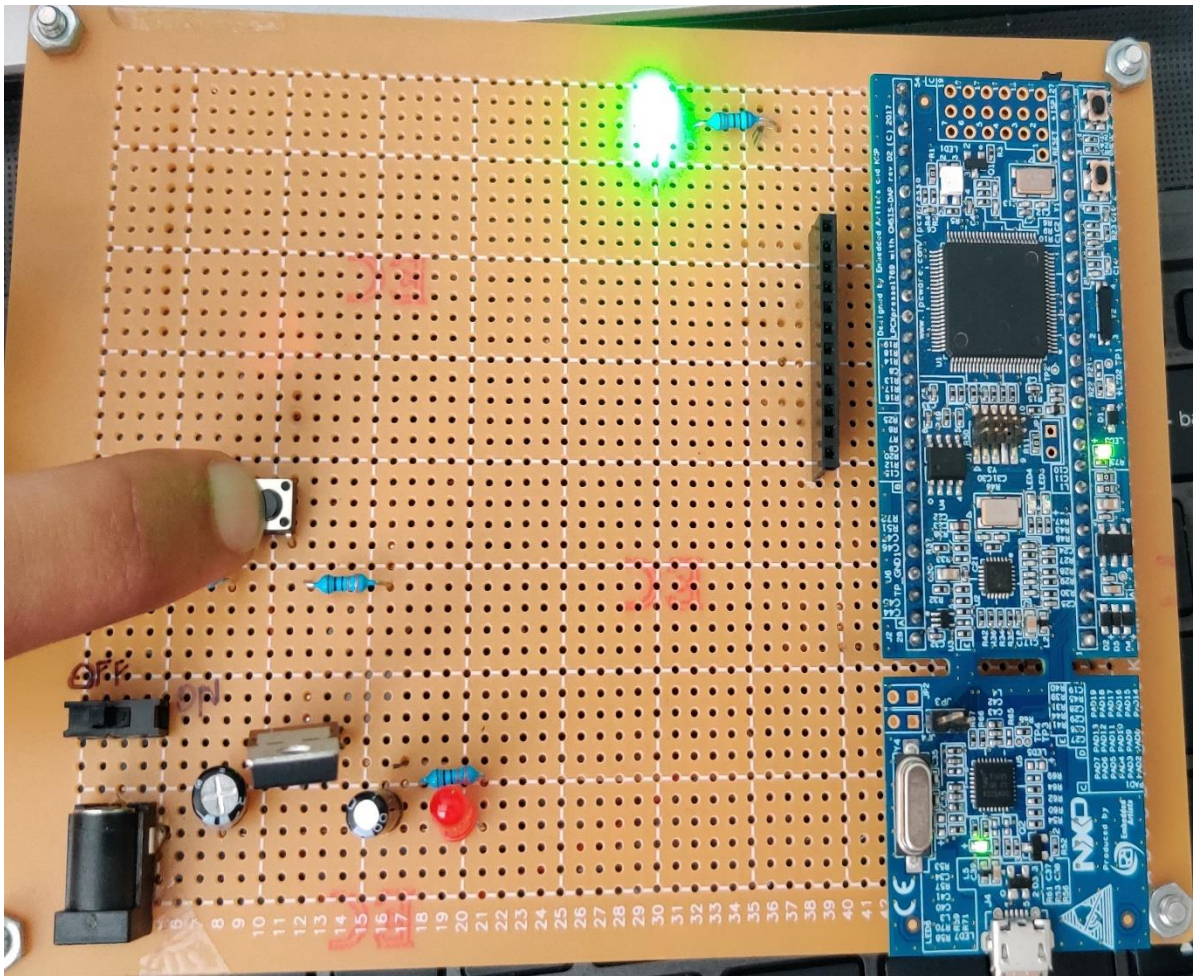
3. GPIO TESTING IMAGE:

Images of GPIO testing result with LED ON and OFF using switch are provided below.

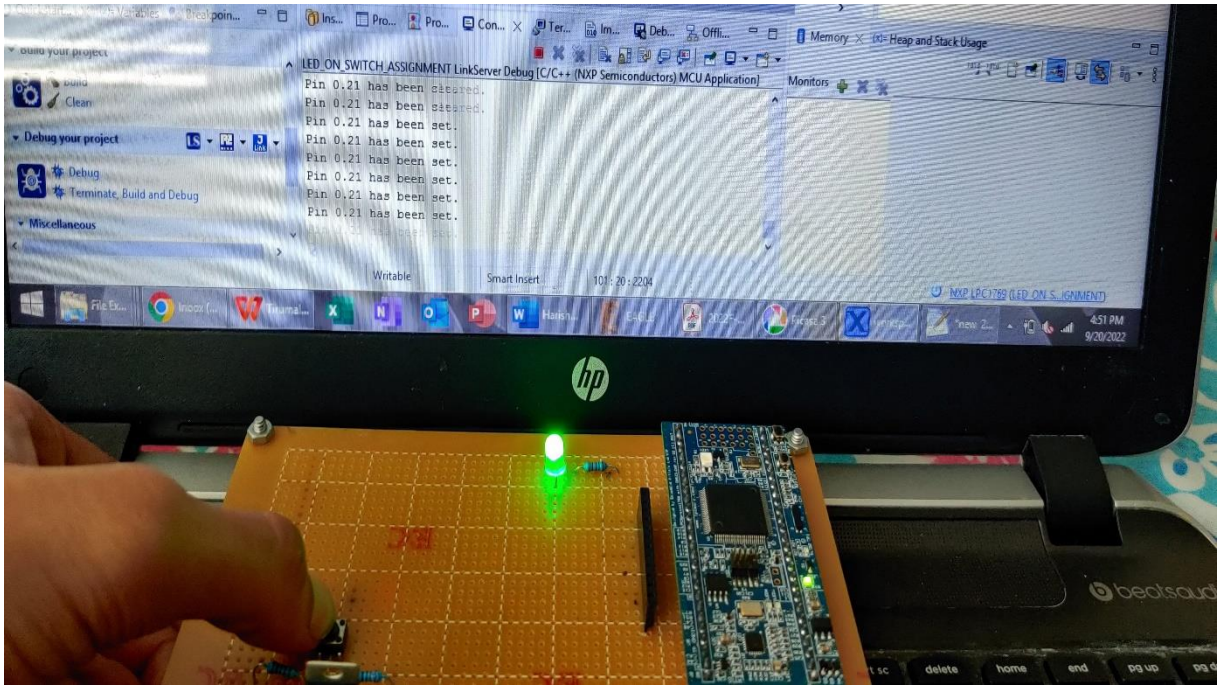
1. This image shows that the LED is OFF because switch is not turned ON.



2. This image shows that the LED is ON upon pressing the button/switch.



3. This image shows that the message in the console is "`Pin 0.21 has been cleared.`" before the switch is pressed (LED is OFF) and "`Pin 0.21 has been set.`" after the switch is pressed (LED is ON).



4. Submitted the assignment on canvas.

CONCLUSION:

In conclusion, in this activity LED is turn ON using switch. By this activity, I gained familiarity with the MCUXpresso software and LPC1769 and soldering.